STATE OF MINNESOTA
PUBLIC UTILITIES COMMISSION

David Boyd	Chair
J. Dennis O'Brien	Commissioner
Tom Pugh	Commissioner
Phyllis Reha	Commissioner
Betsy Wergin	Commissioner

In the Matter of the Application of EcoHarmony West Wind, LLC, for a Site Permit for a 280-Megawatt Large Wind Energy Conversion System and Associated Facilities in Fillmore County

ISSUE DATE:

DOCKET NO.
IP-6688/WS-08-973

FINDINGS OF FACT, CONCLUSIONS OF LAW AND ORDER, ISSUING A SITE PERMIT TO ECOHARMONY WEST WIND, LLC, FOR THE ECOHARMONY WEST WIND PROJECT

The above-entitled matter came before the Minnesota Public Utilities Commission (Commission) pursuant to an application submitted by EcoHarmony West Wind, LLC, (EcoHarmony) for a site permit to construct, operate, maintain and manage a 280-Megawatt (MW) nameplate capacity Large Wind Energy Conversion System (LWECS) and associated facilities in Freeborn County.

All of the proposed wind turbines and associated facilities will be located in Fillmore County. Associated facilities will include pad mounted step-up transformers for each wind turbine, access roads, an electrical collection and feeder system, project substation, and up to four permanent meteorological towers. The energy from the proposed 280 MW project will be delivered from the project substation to the electrical grid at a new Line-Tap (Switching) Substation located approximately one mile east of Harmony, Minnesota.

STATEMENT OF ISSUE

Should EcoHarmony West Wind, LLC, be granted a site permit under Minnesota Statutes section 216F.04 to construct a 280 MW Large Wind Energy Conversion System and associated facilities in Fillmore County?

Based upon the record created in this proceeding, the Public Utilities Commission makes the following:

FINDINGS OF FACT

Background and Procedure

1. On January 26, 2009, EcoHarmony filed a site application with the Public Utilities Commission for up to 200 megawatts of nameplate wind power generating capacity, identified as the Ecoharmony West Wind Project in Fillmore County. (Exhibit 1).

2. Office of Energy Security (OES) Energy Facility Permitting (EFP) staff reviewed and determined that the January 26, 2009, application complied with the application requirements of Minnesota Rules, part 7854.0500. In its comments and recommendations to the Commission, dated February 19, 2009, OES EFP staff recommended that the Commission accept the application and issue a draft site permit (Exhibit 2).

3. On February 27, 2009, a Commission Order accepted the application for the EcoHarmony West Wind Project and associated facilities and also issued a draft site permit for public review and comment (Exhibit 3).

4. On March 23, 2009, OES EFP staff issued a "Notice of Application Acceptance, Public Information and Scoping Meeting" to receive comments on the permit application, the draft site permit, and the scope of the environmental report for the certificate of need proceeding. (Exhibit 4).

5. On March 23 and 24, 2009, EcoHarmony distributed copies of the "Site Permit Application for the EcoHarmony West Wind Project and associated facilities, Draft Site Permit and Notice of Application Acceptance, Public Information and Scoping Meeting" to landowners within the project area and government units. (Exhibits 5 and 6)

6. Published notice of site permit application acceptance, the OES public information and scoping meeting and opportunity to comment on the permit application and the draft site permit appeared in the *Fillmore County Journal*, on March 30, 2009, *Republican-Leader* of Preston and Lanesboro on April 2, 2009, *News-Record* of Harmony and Mabel on April 2, 2009, and the *Bluff County Reader* on March 23 and April 6, 2009. (Exhibit 7). The published notice provided: a) location and date of the public information meeting(s); b) description of the proposed project; c) deadline for public comments on the application and draft site permit; d) description of the Commission site permit review process; and e) identification of the public advisor. The notice published meets the requirements of Minnesota Rules, Part 7854. 0900 subp2.

7. On April 6, 2009, OES EFP staff published in the *EQB Monitor* notice of the application acceptance, public information meeting, and opportunity to comment on the permit application and the draft site permit, Volume 33, No. 7, April 6, 2009. (Exhibit 8, pages

10-14). The published notice contained all of the information required by Minnesota Rules part 7854.0900 subp. 1. Notice also appeared on the Commission web site on eDockets on March 24, 2009 and on the OES web page on March 23, 2009.

8. The OES EFP staff held a public information meeting on April 15, 2009, (in Harmony at the Harmony Fire Department) to provide an overview of the Commission permitting process and to receive comments on the site permit application, draft site permit and scope of the environmental report. Approximately 75 people attended the meeting. OES EFP staff provided an overview of Certificate of Need (CON) and LWECS site permitting processes and responded to questions. OES EFP staff and EcoHarmony representatives responded to project specific questions and general questions about wind energy.

9. Questions were asked about the need for the project, transmission requirements, project timing, geology (karst), audible noise, low frequency noise, impacts on property values, shadow flickers, stray voltage, aerial spraying, property tax and public services required by turbines, setbacks from residences and homes, production taxes, avian impacts, decommissioning, liability for turbine accidents, emergency response situations, turbine lighting, use of local labor, television and phone reception, icing, and decommissioning. Following the public meeting OES staff did receive several calls from people who attended the meeting and had additional questions after reviewing some of the project related materials. The deadline for submitting comments on the site permit application, draft site permit and topics (scoping comments) to be included in the Environmental Report for the Certificate of Need proceeding was May 20, 2009.

10. Ten written comments were received by the close of the comment period. Five comment letters were from the public (Ty and Dacia Bester, Hilary and Kathy Bianchi, Brian Huggenvik, Donald and Margaret Schoepski, and Galyn Simon); four comment letters from state agencies (Minnesota Board of Water and Soil Resources (BWSR), Minnesota Department of Natural Resources (DNR), Minnesota Department of Transportation (MnDOT), and the Minnesota Pollution Control Agency (PCA); and a letter from a representative of EcoHarmony are summarized below. (See Exhibit 9).

    a) Ty and Dacia Bestor commented about noise, shadowing, visual impacts, property valuation, soil damage, and setbacks. Ty and Dacia Bestor also stated: “Create a 2,000 -2,500’ setback, depending on turbine size, from properties that choose not to participate with this current project. By creating this type of setback one can minimize or eliminate the noise, shadowing and visual issues at hand.”

    b) Hilary and Kathy Bianchi commented that the turbines will reduce the value of their home.

    c) Brian Huggenvik commented that he believes there should be a larger setback for non-participating landowners, to mitigate noise, shadow flicker and visual impacts. In conclusion, Mr. Huggenvik stated “I think it is reasonable and responsible to seek an increase in the setbacks to protect the non-participating citizens of Fillmore County from some of the negative effects of industrial wind.

d) Donald and Margaret Schoepski recommended "A minimum distance of 1/3 of a mile from property boundaries would give a much needed buffer for the people that receive the same good feelings about clean energy as any other person in the state, but are the only people in the state that have the negative impacts like decreased property values, increased noise levels and construction dangers."

e) Galyn Simon comments expressed concern about locating turbines in areas characterized by karst topography and asked that due respect be given to non-participating landowners.

f) Steve Lawler, Minnesota Board of Water and Soil Resources, commented that wetland assessment, delineation and wetland conservation act (WCA) application activities should be coordinated with the Local Governing Unit for wetlands in Fillmore County.

g) Randall Doneen, Minnesota Department of Natural Resources, commented about view sheds from the Forestville State Parks, the Cherry Grove Wildlife Management Area and the Cherry Grove Blind Valley Scientific and Natural Area are also close to the project area and suggested preparation of a view shed analysis. DNR also commented about the applicant doing bat surveys.

h) Chris Moates from the Minnesota Department of Transportation (MnDOT) commented that "three miles of MN 139 are within the project area and may be affected by transmission and substation location proposals in the future."

i) Jessica Ebertz, Minnesota Pollution Control Agency (PCA) commented that: "It is actually the Stormwater Pollution Prevention Plan (SWPPP), which is required as part of the application for the NPDES Permit and which site owners and their construction operators must jointly create, that lays out the specific BMPs, along with their locations and functions. Ms. Ebertz also commented that new impaired waters are regularly being identified, and that the list is updated every two years.

j) A representative of EcoHarmony also submitted a letter indicating that: 1) EcoHarmony is committed to analyzing the project's view shed impacts and discussing these findings with the DNR; 2) the Applicant will keep the DNR advised of the work being done on the bat study; and 3) up to four met towers may be required for the project, rather than two as originally proposed.

11. On September 14, 2009, the OES issued the "Environmental Report Scoping Decision" document for the EcoHarmony West Wind Project.

12. On October 22, 2009, OES provided "Notice of Availability of Environmental Report" for the EcoHarmony West Wind Project for the CN proceeding (Docket No. IP-6688/CN-09-961.

13. On October 26, 2009, the Commission issued Notice of the November 9, 2009, Public Hearing in Harmony. The notice was published in Fillmore County in *The Fillmore County Journal* on October 26, 2009. (Exhibit 10).

14. On November 9, 2009, a public hearing was held in Harmony, Minnesota, to receive public testimony on need and siting matters. Public comments and exhibits were recorded and entered into the record, with additional comments allowed to be submitted on or before November 23, 2009.

15. Administrative Law Judge (ALJ) Steve M. Mihalchick presided over the public hearing the evening on November 9, 2009. The ALJ's Summary of Public Testimony was submitted to the PUC on December 21, 2009. (Exhibit 11).

Permittee

16. EcoHarmony West Wind, LLC, a limited liability company, filed a site permit application for the EcoHarmony West Wind Project in Fillmore County. EcoHarmony West Wind, LLC, is a wholly-owned subsidiary of EcoEnergy Wind. EcoEnergy Wind is a wholly-owned subsidiary of The Morse Group, Inc., a national; commercial electrical, energy and construction firm. EcoEnergy Wind intends to develop the Project and manage its overall construction. During development, Eco Energy Wind will explore opportunities to joint venture with established renewable energy companies and/or utilities to secure turbine supply and finalize financing.

Project Description

17. The EcoHarmony West Wind Project as proposed was to have a nameplate capacity of 200 hundred megawatts, and then EcoHarmony amended its CN and site permit applications to increase nameplate capacity from 200 MW to 280 MW for the following reasons: a) the demand for renewable energy will support an investment in a larger project, b) the wind resource in Fillmore County are and within the existing footprint of the West Wind Project will allow for the operation of a larger project, and c) the MISO interconnect line planned for the EcoHarmony West Wind Project can handle the additional power. (Exhibit 12). A final decision on turbine selection and design has not been made, but the project will consist of turbine with a rated output between 1.5 and 3.0 MW in such number and combination as produce 280 MW. Turbines are typically placed on towers 80 meters (262 feet) in height. Rotor diameters vary from 77 to 101 meters (253 to 331 feet).

18. Some permit conditions for large wind energy conversion system (LWECS) are based on criteria that are dependent on turbine size. Turbines must be placed within the project boundary and meet all permit conditions. Accordingly, the final siting ("micro-siting") of wind turbines for the project will depend on, among other factors, the size of the turbines chosen for the project.

19. The project will also include an underground automated supervisory control and data acquisition system (SCADA) for communication purposes. Up to four permanent meteorological towers will be used as part of the communication system. Other components of the project include a concrete and steel foundation for each tower, pad-mounted step-up transformers, all weather class 5 roads of gravel or similar material, and an underground energy collection system and a project substation.

20. Each turbine is interconnected through an underground electrical collection system at 34.5 kV. The feeder lines from the project collection system feed the power to the independent breaker positions at the proposed project substation. The project substation steps up the voltage from the 34.5 kV collection systems to the 161 kV transmission system level. All of the proposed feeder lines would connect to the proposed project substation within the site permit boundaries.

21. Each tower will be secured by a concrete foundation that will vary in size depending on the soil conditions. A control panel that houses communication and electronic circuitry is placed in each tower. In addition, a step-up, pad-mounted transformer is necessary for each turbine to collect the power from the turbine and transfer it to a 34.5 kV collection system via underground cables.

22. The blades are typically made of fiberglass with a smooth layer of gel coat that provides ultraviolet protection. The blades will be either white or grey in color. The blades will be equipped with lightning protection. The entire turbine is also grounded and shielded to protect against lightning.

23. All turbines and up to four permanent meteorological towers will be interconnected with fiber optic communication cable that will be installed underground. The communication cables will run back to a central host computer which will be located either at the project substation or at the operations and maintenance facility where a supervisory control and data acquisition (SCADA) system will be located. Signals from the current and potential transformers at each of the delivery points will also be fed to the central SCADA host computer. The SCADA system will be able to give status indications of the individual wind turbines and the substation and allow for remote control of the wind turbines locally or from a remote computer. This computerized supervisory control and data acquisition network will provide detailed operating and performance information for each wind turbine. The Permittee will maintain a computer program and database for tracking each wind turbine's maintenance history and energy production.

24. A separate 161 kV transmission line approximately 8.5 miles in length will connect the Eco Harmony West Project substation to a new EcoHarmony switching station that will tie into a ITC owned 161 kV transmission line southeast of Harmony. The EcoHarmony 161 kV transmission line is being reviewed by the PUC (See PUC Docket No. IP-6688/TL-09-601).

Site Location and Characteristics

25. The 280 MW EcoHarmony West Wind Project, will be located in southeastern Minnesota, in the townships of Harmony, Bristol, York, Carimona, Forestville and Preston-all in Fillmore County. The project boundary encompasses approximately 50,000 acres. These townships are zoned agricultural. The topography within the site is comprised of rolling hills with long low ridges and intermittent drainage ways and minor streams. The site includes a number of broad ridges with elevations approximately 1,350 above mean sea level. Surrounding elevations are lower by as much as 150 to 200 feet. The primary ridge in the area lies in an easterly to westerly direction and is a prominent landscape feature. The project area includes karst-a landform shaped by the slow dissolution of limestone rock. The dominant land use is agricultural, comprised of corn and soybeans. There are also numerous woodlots and windbreaks within the proposed site boundaries. Average farm size in Fillmore County is approximately 280 acres; and the County has a population density of around 24 persons per square mile, which is considered low.

26. Construction of the turbines sites and access roads will involve temporarily disturbing at the most approximately five to ten acres of land per turbine or approximately 600 to 1,200 acres for the Project for contractor staging areas, foundation construction, underground power lines, and tower and turbine assembly. Permanent roads are expected to be about 16 feet wide. The permanent displacement for turbine access roads and for towers and transformers and areas around them is about 0.5 to 1 acre per turbine for the EcoHarmony West Wind Project. The project substation, operations and maintenance building will displace approximately 10 acres of land.

27. Wind turbines and road access will be sited to take into account the contours of the land, local permitting requirements, landowner concerns and prime farmland locations to minimize project impacts. The Project will be subject to the requirements of the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Construction Stormwater Permit. An erosion and sediment control plan and Storm Water Pollution Prevention Plan (SWPPP) will also be prepared for the Project and the disturbed areas will be seeded after construction to stabilize the area.

Wind Resource Considerations

28. Information in the site permit application indicates that the 80 meter wind speeds in the Project Area average from 17.0 to 17.9 miles per hour (7.6 to 8.0 meters per second) (mean average annual). Typically the highest wind speeds occur in the colder winter months due to recurring storm systems and large temperature gradients. Regionally, the prevailing wind directions are generally south-southeast and northwest. Wind speeds are generally greater in the afternoon and late evening. The lowest wind speeds are in the mid-morning and in the early evening. Of the annual energy budget, a higher percentage results from southerly winds, which are most frequent in the warmer weather months.

29. For this project, turbines will be sited in "strings and clusters" along hilltops and ridgelines within the site boundaries. The wind turbines are sited so as to have good exposure to winds from all directions with emphasis on exposure to the prevailing southerly and northwesterly wind directions. The turbine spacing, according to EcoHarmony's application, maximizes use of the available wind and minimizes wake and array losses within the topographical context of the site. The turbines are typically oriented west-southwest to east -northeast, which is roughly perpendicular to the prevailing southerly and northwest winds. Turbine placement, aside from other resource features where setbacks or wind access buffers are required, will be designed to provide sufficient spacing between the turbines to minimize internal wake losses. Given the prevalence for southerly and northerly winds, turbine spacing is widest in the north-south direction. Greater or lesser spacing between the turbines or turbine strings may be used in areas where the terrain and other factors dictate the spacing. This is addressed in the permit at III.E.5. Individual, isolated turbine sites may be necessary to minimize Project impacts. Sufficient spacing between turbines is utilized to minimize wake losses when the winds are blowing parallel to the turbines.

30. Assuming net capacity factor (NCF) of 38 percent, projected average annual output will vary based on the model and size of turbine selected the actual wind resource and the facility's operating efficiency. The net annual energy output for the project, as modeled at 200 MW, is expected to be about 603 GWh/yr, at 280 MW the project would produce around 840 GWh/yr. The base energy calculation presented assumes a normal or average wind year. The maximum variation in energy is within +/- 15 percent. Based on the data, one would expect the annual variation in energy at the project site to be within 10 percent of the mean during most years.

Land Rights and Easement Agreements

31. In order to build a wind plant, a developer needs to secure site leases and easement option agreements to ensure access to the site for construction and operation of a proposed project. These lease or easement agreements also prohibit landowners from any activities that might interfere with the execution of the proposed project.

32. Within the project site boundary there are approximately 475 landowners and approximately 50,000 acres of land. EcoHarmony has obtained lease and easement option agreements and/or rights to such agreements with 118 different property owners of 327 parcels totaling approximately 24,750 acres of land within the project site boundary. Land and wind rights will need to encompass the proposed wind farm and all associated facilities, including but not limited to wind and buffer easements, wind turbines, access roads, meteorological towers, electrical collection system and electric lines located on or along public road rights-of-way.

Site Criteria

33. Minnesota Rules chapter 7854 applies to the siting of Large Wind Energy Conversion Systems. The rules require an applicant to provide a substantial amount of information to allow the PUC to determine the potential environmental and human impacts of the

proposed project and whether the project is compatible with environmental preservation, sustainable development, and the efficient use of resources. Minn. Rules Parts 7854.0500 through 7854.0600. The following analysis addresses the relevant criteria that are to be applied to a LWECS project.

Human Settlement, Public Health and Safety

34. The site is in an area of relatively low population density, approximately 24 people per square mile, which characteristic of rural areas throughout southeastern Minnesota. EcoHarmony has established a minimum setback of 1,000 feet to any residence, whether that landowner is a participating or a non-participating landowner. EcoHarmony will also be required to set back its turbines a minimum of five rotor diameters (1,265 to 1,655 feet) on the prevailing wind axis from non-participating landowner's property lines and three rotor diameters on the non-prevailing wind axis (759 to 993 feet). EcoHarmony's proposed project design will be required to comply with the Minnesota Pollution Control Agency (PCA) noise standards. As a result, the impact of the proposed LWECS on human settlement, public health and safety will be minimal. The site permit, at part III.C and III.M.1 has conditions for setbacks from residences. The proposed wind turbine layout will meet or exceed those requirements. The proposed project is not expected to affect any water wells (used, unused or unsealed) or any rural water system that services the area.

35. There will be no displacement of existing residences or structures in siting the wind turbines and associated facilities.

36. EcoHarmony will coordinate with the Federal Aviation Administration (FAA) to identify and address any potential air hazards that may be created by the Project. The project will comply with the Federal Aviation Administration requirements with respect to lighting. See site permit condition III.E.4. The only airport in the area is the Preston/Fillmore County airport, which is approximately 3.5 miles north of the project boundary and more than 4 miles from any potential turbine location. The Hammervold Landing Strip located in Section 34 of Harmony Township is a small and seldom used airstrip about 0.5 miles from the project boundary and approximately two miles from any potential turbine site.

37. The Permittee will provide security during construction and operation of the project, including fencing, warning signs, and locks on equipment and facilities. The Permittee will also provide landowners and interested persons with safety information about the project and its facilities. See site permit condition III.B.15.

38. In winter months ice may accumulate on the wind turbine blades when the turbines are stopped or operating very slowly. Furthermore, the turbine anemometer may ice up at the same time, causing the turbine to shut down during any icing event. As weather conditions change, any ice will normally drop off the blades in relatively small pieces before the turbines resume operation. This is due to flexing of the blades and the blades' smooth surface. Although turbine icing is an infrequent event, it remains important that the turbines are not sited in areas where regular human activity is expected below the turbines during the winter months.

39. Each turbine will be clearly labeled to identify each unit and a map of the site with the labeling system will be provided to local authorities as part of the fire protection plan. See permit condition III.B.17.

Noise

40. Background noise levels in the Project Area are typical of those in a rural setting, where existing nighttime noise levels are commonly in the low to mid-30 dBA. The dBA scale represents A-weighted decibels based on the range of human hearing. Higher levels exist near roads and other areas of human activity. Wind conditions in the Project Area also tend to increase ambient noise levels when the wind is blowing.

41. Noise levels predicted by noise modeling program, such as Windfarmer, will be compared to the Minnesota Pollution Control Agency Daytime and Nighttime L10 and L50 Limits as stated in Minn. Rule 7030.0040. These standards describe the limiting levels of sound established on the basis of present knowledge for the preservation of public health and welfare. These standards are consistent with speech, sleep, annoyance, and hearing conversation requirements for receivers within areas grouped according to land activities by the Noise Area Classification (NAC) system established in Minn. Rule. 7030.0050. The NAC-1 was chosen for receivers in the Project Area since this classification includes farm houses as household units. Daytime and nighttime limits for this classification are (1) L50 limit of 60 dBA and L10 limit of 65 dBA in daytime, and (2) L50 limit of 50 dBA and L10 limit of 55 dBA at nighttime. The nighttime L50 limit of 50 dBA is the most stringent limit.

42. Wind turbines blades, when in motion, do generate a perceptible sound or noise. The level of sound (noise) varies with the speed of the turbine and the distance of the listener or receptor from the turbine. On relatively wind days, the turbines create more noise; however, the ambient or natural wind noise levels tend to override the turbine noise as distance from the turbine increases.

43. During the initial public comment period which closed on May 20, 2009, and at the November 2009 hearing, members of the public expressed concerns about possible health effects of low frequency vibrations and sound from wind turbines. In late February 2009, OES requested a "white paper" from the Minnesota Department of Health (MDH) evaluating possible health effects associated with low frequency noise vibrations and sounds arising from large wind energy conversion system (LWECS). A commenter on another wind project, the Lakeswind Wind Power Plant, in Clay, Becker and Ottertail counties, also wrote to the Commissioner of MDH to ask for an evaluation of health issues related to exposure to low frequency sound energy generated by wind turbines. In March 2009, MDH agreed to evaluate health impacts from wind turbine noise and low frequency vibrations. The MDH released its "white paper" on the "Public Health Impacts of Wind Turbines on May 22, 2009. This report is available online at: http://energyfacilities.puc.state.mn.us/documents/Public%20Health%20Impacts%20of%20Wind%20Turbines,%205.22.09%20Revised.pdf.

44. In a letter to Mr. and Ms. Anderson, (See OES Exhibit 12 in Docket 08-573) dated August 13, 2009, MDH Commissioner, Sanne Magnan, M.D., Ph.D, responded to specific questions posed by Mr. Anderson as follows:

> *Are current standards in Minnesota safe?* Regulatory standards protect health and safety, but whether for air, water or noise, regulators do not set "bright line" standards without also considering cost, technical difficulties, possible benefit and alternatives. No regulatory standard offers absolute safety. The Minnesota Department of Health can evaluate health impacts, but it is the purview of regulatory agencies to weigh these impacts against alternatives and possible benefits.
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> *Are the proponents of wind turbine syndrome mistaken?* As noted in the "White Paper," the evidence for wind turbine syndrome, a constellation of symptoms postulated as mediated by the vestibular system, is scant. Further, as also noted, there is evidence that the symptoms do not occur in the absence of perceived noise and vibration. The reported symptoms may or may not be caused by "discordant" stimulation of the vestibular system.
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> *Does more study of adverse effects need to be undertaken?* More study may answer questions about the actual prevalence of unpleasant symptoms and adverse effect under various conditions such as distance to wind turbines and distribution of economic benefit. However, there is at present enough information to determine the need for better assessment of wind turbine noise, especially at low frequencies. Such assessments will likely be beneficial for minimizing impacts when projects are sited and designed. Also, even without further research, there is evidence that community acceptance of projects, including agreement about compensation of within project areas, will result in fewer complaints. Therefore, more research would be useful, but the need will have to be balanced against other research needs.

45. Cumulative noise impacts to nearby residents and other potentially affected parties will be factored into the turbine micrositing process. EcoHarmony must ensure compliance with PCA noise standards. See permit condition III.E.3.

46. EcoHarmony has evaluated both noise and shadow flicker during the planning stages of the EcoHarmony West Wind Project to make informed decisions about turbine placement. However, to insure proper placement of the turbines with respect to residences the proposed site permit also requires EcoHarmony to submit a proposal to the Commission for the conduct of a noise study designed to determine the noise levels at different frequencies and at various distances from the turbines at various wind directions and speeds. See permit condition III.M.2.

Shadow Flicker

47. During the public comment period and in the public hearing record concern about shadow flicker was also raised. Shadow flicker is described as "a moving shadow on the ground resulting in alternating changes in light intensity." Shadow flicker computer models simulate the path of the sun over the year and assess at regular time intervals the possible shallow flicker across a project area. The outputs of the model are useful in the design phase of a wind farm. Other than within approximately two rotor diameters from the base of a turbine, shadow flicker usually occurs in the morning and evening hours when the sun is low in the horizon and the shadows are elongated. Shadow flicker does not occur when the turbine rotor is oriented parallel to the receptor, or when the turbine is not operating. In addition, no shadow flicker will be present when the sun seen from a receptor is obscured by clouds, fog, or other obstacles already casting a shadow such as buildings and trees.

48. Shadow intensity, or how "light" or "dark" a shadow appears at a specific receptor, will vary with the distance from the turbine. Closer to a turbine, the blades will block out a larger portion of the sun's rays and shadows will be wider and darker. Receptors located farther away from a turbine will experience much thinner and less distinct shadows since the blades will not block out as much sunlight. Shadow flicker will be greatly reduced or eliminated within a residence when buildings, trees, blinds or curtains are located between the turbine and receptor. Shadow flicker consultants generally agree that flicker is not noticeable beyond about 10 rotor diameters from a wind turbine. Evidence of flicker effects is hard to find, it is more of a nuisance issue. There are no published standards for shadow flicker and no examples of turbines causing photosensitivity related problems. In Germany, 30 hours of shadow flicker per year is acceptable. The 30 hour number is based on the premise that the sun is shining, the building affected is occupied, the occupants are awake and the turbine is operating. The proposed site permit does not specify shadow flicker limits. However, the setback requirement from residences takes into account shadow flicker disturbances.

49. The proposed site permit at condition III.M.3 requires the Permittee to provide data on shadow flicker impacts and to report on the results of modeling used (if any), assumptions made, and the anticipated levels of impact from wind turbine shadow flicker.

Visual Values

50. The placement of between 83 and 186 wind turbine generators for the EcoHarmony West Wind Project, will affect the appearance of the area. The wind turbines will be mounted on tubular towers that are approximately 262 feet tall. The rotor blades, depending on the turbine model selected will have a diameter of between 253 to 331 feet. The turbine towers and rotor blades will be prominent features on the landscape. There will be intermittent, expansive views of the turbines to passing motorists on highways state highway, county and township roads. Motorists and drivers on local township and county roads may travel within 300 feet of some turbines.

51. The visual impact of the wind turbines will be somewhat reduced by the use of a neutral paint color. The only lights will be those required by the Federal Aviation Administration. All site permits issued by the Commission require the use of tubular towers; therefore, the turbine towers will be uniform in appearance. Blades used in the proposed project will be white or grey. The wind turbines in this project, while prominent on the landscape, also blend in with the surrounding area. The project site will retain its rural character. The turbines and associated facilities necessary to harvest the wind for energy are not inconsistent with existing agricultural practices.

52. From one perspective, the proposed project might be perceived as a visual intrusion on the natural aesthetic value on the landscape, characterized by up to 187 tubular steel structures approximately 262 feet high, standing on formerly undisturbed high-ground, with 133 to 165 foot long blades blades, for an overall height of between 398 to 428 feet when one blade is in the vertical position. Wind plants have their own aesthetic quality, distinguishing them from other non-agricultural uses. Existing wind plants have altered the landscape elsewhere in Minnesota from agricultural to wind plant/agricultural. This project will modify the visual character of the area. Because wind generation development is likely to continue in Fillmore County, this visual presence will continue to increase as wind development occurs. To date, the presence of the wind turbines in other parts of Minnesota has been well accepted by the people who live and work in those areas.

53. As noted in the ALJ's summary, the Minnesota Department of Natural Resources (DNR) expressed concern regarding the alteration of a historically significant view from the Forestville State Park, based a preliminary view shed analysis prepared by EcoHarmony and discussed with the DNR that indicated that 10 to 15 proposed turbine sites would be visible from the Forestville State Park outlook site. The Forestville State Park outlook site is a frequently visited overlook that represents a presettlement vista of the unique landscape of southeastern Minnesota. The DNR subsequently determined that turbines located north of County Route 44 and west of Kodiac Road may alter the view shed and recommended avoiding the placement of turbines in the northwest corner of the Project area, or coordinating turbine placement with the DNR to avoid visual impacts. The DNR also suggested that, to the extent that fewer turbines are ultimately installed, installation of turbines for the Project be commenced in areas other than the northwest corner of the project area. (See Exhibit 13).

54. EcoHarmony responded to DNR's concerns regarding the Forestville State Park overlook and indicated that the nearest turbine will be approximately three miles away. At that distance, EcoHarmony estimates that "between ten and twenty of the wind turbines will be partially visible above the tree line from an observation deck facing the southeast." As to other proposals by the DNR, EcoHarmony responded as follows:

> EcoHarmony has met with the DNR to discuss its concern and will continue to meet with the DNR during the micrositing process as the precise locations for turbines are selected. However, it is simply not going to be possible to avoid having some turbines be

visible from certain locations in the Park. Significantly, the turbines will not be visible from most locations in the Park and not in directions other than southeast.

There are other countervailing factors that must be taken into account besides DNR's desire that its Park visitors no see wind turbines while looking over the parkland. Private landowners have the right to install wind turbines on their property. The DNR cannot deprive these landowner of their rights simply because Park visitors may be able to see them.

Further, the State and EcoHarmony are also interested in making efficient use of the wind resources. The law requires the Commission to not only consider environmental impacts but to site wind projects to make efficient use of the wind resource. Minn. Stat. section 216F.03. Elimination of locations to protect a view shed could make the project less efficient from an energy standpoint.

55. The DNR does not have any view shed or scenic easements on lands outside of the Forestville State Park that provide for protection of the view on property outside of the park. As EcoHarmony observed, the nearest turbine will be more than three miles from the state park. A permit condition that requires a setback from the Forestville State Park is not warranted. The OES believes that EcoHarmony and DNR can continue to meet and discuss this issue during the micrositing process.

56. Visually, the EcoHarmony West Wind Project will be similar to other LWECS projects located in Mower County or counties in southwestern Minnesota on Buffalo Ridge.

Recreational Resources

57. Recreational opportunities in Fillmore County include hiking, biking, canoeing, fishing, camping, swimming, horseback riding, skiing, hunting, and nature viewing. A DNR bike trail lies between the cities of Harmony and Preston. This trail alignment is located no closer than ½ mile from the Project's signed parcels and will not be physically affected the Project. (Exhibit 1, p.37)

58. The Cherry Grove Blind Valley Scientific and Natural area and its adjacent Cherry Grove Wildlife Management Area, are approximately four miles to the west of the Project's western boundary and will not physically be impacted by the Project. (Exhibit 1, p.37).

59. Neither turbine nor access roads will be sited in proximity to navigable waterways or trout streams; and those features will not be impacted by the Project. At least five rotor diameters (RD) on the prevailing wind axis and at least 3 RD on the non-prevailing wind from WMAs or local parks are required. See permit condition III.C.4. Turbine operations are not expected to directly affect the natural areas in any material way and no adverse impact on wildlife management areas or practices is expected.

Public Services and Infrastructure

60. The proposed project will have many miles of underground cables for the collector lines on private property within the wind farm. The underground cables will be installed in a trench that is at least 48 inches in depth. Most of the underground electric circuits will parallel existing turbine maintenance roads or public road rights-of-way. However, some of these underground circuits will cross private rights-of-way. EcoHarmony will locate the underground cable layout in a manner that meets affected landowner requirements, minimizes impact to the environment and achieves required economics. Above ground cable vaults measuring, approximately 48 inches by 60 inches, will be installed where underground cable circuits intersect. The vaults will be installed in a manner to minimize visual impact, avoid interference with intended land use, and ensure the public is protected. Where appropriate, posts will be installed adjacent to the underground cable vaults to minimize damage by farm equipment or vehicles. Cable circuits will be installed underneath public rights-of-way in compliance with road permits received from appropriate public authorities. Placement of collector and feeder lines is addressed in the site permit at III.E.7 and 8. The proposed wind farm is expected to have a minimal effect on the existing infrastructure. (Exhibit 1, p 34-36).

61. The project will require the use of public roads to deliver construction supplies and materials to the work site. Site permit condition III.B.8. addresses this topic. EcoHarmony has met with county and township road authorities to initiate discussion of the project's impact on their roads. EcoHarmony, in consultation with road authorities, will develop a formal Transportation Plan for the project's construction. This plan will identify the roads proposed for use in constructing the project, the number, size and weight of vehicles and loads proposed to access these roads, and the road improvements that are necessary both before and after the project construction is complete. The Transportation Plan will also include a schedule for the delivery of materials and equipment for the project and provide contact information for individuals involved with the overall logistics of the project's construction. The Transportation Plan will be reviewed with county, township and state road officials and revised as necessary in response to comments and concerns. EcoHarmony will work with all road officials to ensure that any impacts on the project on the road systems are addressed and resolved to satisfaction. (Exhibit 1, p 34-36).

62. Wear and tear on roads will occur as a result of the transport of heavy equipment and other materials. The site permit at III.B.8, addresses road damages. Construction of the project requires the addition of access roads that will be located on private property. The access roads will be routed along the wind turbine strings, fence lines, and field edges to minimize disturbance to agricultural activities. The typical access road will be 15 to 20 feet in width and covered in Class 5 gravel (or similar material). The access roads will be low profile roads to allow for the movement of agricultural equipment. The site permit at III.B. 8 (b) addresses this topic. During operation and maintenance of the wind plant, operation and maintenance crews, while inspecting and servicing the wind turbines, will use access roads. Periodic grading and maintenance activities will be used to maintain road integrity. The Permittee may do this work or contract it out.

63. If access roads are installed across streams or drainage ways, the Permittee in consultation with the Minnesota Department of Natural Resources will design, shape and locate the road so as not to alter the original water flow or drainage patterns. Any work required below the ordinary high water line, such as road crossings or culvert installation, will require a permit from the Minnesota Department of Natural Resources. See site permit at III.K.7.

64. The proposed wind farm will not affect water supplies, railroads, telecommunication facilities, and radio reception. The presence or operation of the wind plant could potentially impact the quality of television reception in the area. Previous work on television reception issues indicates that in some cases new antennas or relocation of existing antennas can restore television signal strength reception. The Permittee will address the concerns of residents in the area of the project site before and after project construction to document and mitigate any television reception impacts that might occur. This is addressed in the site permit at III.D.3.

65. Construction, operation, and maintenance of the proposed wind plant will comply with all of the required federal and state permit requirements. See site permit at III.K.7.

Community Benefits

66. The EcoHarmony West Wind Project will pay a Wind Energy Production Tax to the county and townships of several hundred thousand dollars or more per year. Landowners with turbine(s) and/or wind easements on their property will also receive payments from the Permittee.

67. To the extent that local workers and local contractors are capable, qualified, and available, EcoHarmony will seek to hire them to construct the proposed project. The hiring of local people will expand employment opportunities in this area of the state and keep money in the local economy. Once constructed, the project will be staffed with several site technicians and a wind plant supervisor.

Effects on Land-Based Economies

68. The wind turbines and access roads will be located so that the most productive farmland will be left as intact as possible. However, on average each turbine and all associated access roads will permanently displace approximately 0.5 to 1.0 acre of agricultural land. The site permit at III.B. 2., 3., 4., 5., 6., 7., 8(c)., 9., and 10. addresses mitigation measures for agricultural lands. The proposed project does not adversely affect any sand or gravel operations.

Archaeological and Historical Resources

69. EcoHarmony engaged Pathfinder CRM of Spring Gove, Minnesota to prepare an archival report for the project area to include cultural and archaeological considerations. A listing of those identified resources is included in the full Site Permit Application as exhibit 2. (See exhibit 1). The report identified both historical land archaeological resources with in

the project boundary. As EcoHarmony stated in its application: "The final project layout and design will be set to avoid impact to these known resources. In addition, upon final siting of the individual wind turbines and related facilities Pathfinder will perform individual Phase I Archaeological Reviews to ensure that the construction does not compromise any known or unknown cultural or archaeological resources." (Exhibit 1, p. 37).

70. An archaeology survey is recommended for all the proposed turbine locations, access roads, junction boxes and areas of construction impact for the transmission line to document any previously unrecorded archaeological sites within the project site. The site permit at III. D.2. requires the Permittee to conduct an archaeological reconnaissance survey (Phase I). A Phase I archaeology survey consists of the following tasks: consultation, documentation, and identification. A Phase I survey provides enough information to allow consideration of avoidance if a site is to be impacted by an undertaking and to gather enough information to allow for reasonable recommendations for more detailed work should it be necessary.

71. If any archaeological sites are found during the Phase I survey, their integrity and significance should be addressed in terms of the site's potential eligibility for placement on the National Register of Historic Places (NRHP). If such sites are found to be eligible for the NRHP, appropriate mitigative measures will need to be developed in consultation with the Minnesota State Historic Preservation Officer (SHPO), the State Archaeologist, and consulting American Indian communities. The site permit (III.D.2.) also requires the Permittee to stop work and notify the Minnesota Historical Society and Commission if any unrecorded cultural resources are found during construction.

72. Comments made at the public hearing by Ms. Huggenvik noted that the Ravine House, listed on the National Register of Historic Places is in the Project Area. The Ravine House is also known as the Daniel Dayton House. This house was noted as being included in archival discussed in the above findings. EcoHarmony in its written response indicated that three turbines will be located south of the location of the Ravine House; the nearest turbine will be over 1800 feet away and the other two turbines are more than 2000 feet from the house. Consequently no impact to the Ravine House is anticipated.

Air and Water Emissions

73. No harmful air or water emissions are expected from the construction and operation of the LWECS.

Wildlife

74. The majority of the project area and surrounding landscape is used for agricultural purposes with crop land comprising a significant portion of the vegetative cover. Scattered patches of grasslands, forested hillsides and wetlands make up the remaining wildlife habitat with the project boundary. Base on the geographic range and the habitat available within the project boundary and surrounding area, there are numerous wildlife specie that will occupy this area on a seasonal or year round basis. (Exhibit 1, p. 50).

75. With proper planning neither construction nor operation of the Project is expected to have a significant impact on wildlife. Based on studies of existing wind power projects in the United States and Europe, the only impact of concern to wildlife would primarily be to avian and bat populations. The final report on avian monitoring studies at Buffalo Ridge, Minnesota "Final Report-Avian Monitoring Studies at the Buffalo Ridge, Minnesota Resource Area: Results of a 4-Year Study" (September 2000) identified the following impacts:

a. Following construction of the wind turbines, there is a reduction in the use of the area within 100 meters of the turbines by seven of 22 species of grassland breeding birds. It was hypothesized that lower avian use may be associated with avoidance of turbine noise, maintenance activities, and less available habitat. The researchers stated "on a large scale basis, reduced use by birds associated with wind power development appears to be relatively minor and would not likely have any population consequences on a regional level." (p. 44)

b. Avian mortality appears to be low on Buffalo Ridge, compared to other wind facilities in the United States, and is primarily related to nocturnal migrants. Resident bird mortality is very low and involves common species. The researchers stated that "based on the estimated number of birds that migrate through Buffalo Ridge each year, the number of wind plant related avian fatalities at Buffalo Ridge is likely inconsequential from a population standpoint." (p. iv)

c. Bat mortality was also studied at Buffalo Ridge, instigated by bat collision victims found during the avian monitoring studies. The bat study was conducted in 2001 and 2002. ("Bat Interactions with Wind Turbines at the Buffalo Ridge, Minnesota Wind Resource Area," November 2003). The overall conclusion is that bat activity at turbines and the numbers of bat fatalities do not share a statistical relationship. Bat collisions were found to be very rare, given the amount of bat activity documented at the turbines. Most fatalities involved migrating or dispersing bats occur in the fall. Fatality estimates at Buffalo Ridge indicate that the population of bats susceptible to turbine collisions is large, and that the observed number of fatalities "is possibly not sufficient to cause significant, large-scale population declines." (p. 6-1)

76. Mitigation measures are prescribed in the site permit and include but are not limited to: a) a pre-construction inventory/survey of existing biological resources, native prairie, state listed and threatened species and wetlands in the project area (Site Permit III.D.1); b) turbines and associated facilities will not be constructed in wildlife management areas, recreation and state scientific and natural areas or parks (Site Permit III.C.4) and a 5 by 3 rotor diameter setback is provided (Site Permit III.C1). In its permit application EcoHarmony outlined practices it will take to implement and minimize impacts to federal and state-listed species and rare or sensitive habitat in the Project Area during micrositing of the turbines and access roads and the subsequent development and operation of the Project. (Exhibit 1, p 50-51 and exhibit 4 in the full application which is the Natural Resources Consulting, Inc. "NRC" Report on Wetlands, Waterways, Vegetation, and

Wildlife and exhibit 5, which is NRC's Avian Study Plan and Preliminary Results. The site permit has requirements to implement sound water and soil conservation practices during construction and operation of the project throughout the Project's life in order to protect topsoil and adjacent resources and to minimize soil erosion (Site Permit III.B.9). This also applies to any work in proximity to watercourses (Site Permit III.C.5).

77. The November 20, 2009, DNR comment letter submitted to the ALJ also discussed the bird and bat surveys conducted by EcoHarmony. The DNR recommended that EcoHarmony's final bird and bat survey reports, expected in early 2010, be considered when micrositing each turbine. The DNR further recommended that EcoHarmony's micrositing be coordinated with the DNR utilizing information from these reports to avid impacting local and migratory bird and bat populations. (Exhibit 13).

78. In conjunction with the discussion of avian issues and as noted the ALJ Summary of Testimony at Public Hearings, the potential impact of the Project on avian populations, particularly that of bald eagles, was raised by Christian Frank and Noel Frank, farm owners in Fillmore County. The Franks noted that an active bald eagle nesting site was located in the southwestern portion of section 1 in Bristol Township. The Franks also related observations of eagles using the valley encompassing their family farm for winter habitat. To protect this population, the Franks recommended adoption of a 1-mile setback requirement for all wind turbines from the areas used by bald eagles. The Franks expressed their belief that this setback requirement would affect five proposed wind turbine locations. The Franks also recommended that any micrositing be done in consultation with the DNR and a wildlife biology specialist from the U.S. Fish and Wildlife Service. (Exhibit 11, p. 12-13).

79. EcoHarmony in its response letter stated: As to the potential impact on eagles, EcoHarmony indicated that its consultant, Natural Resources Consulting, Inc., currently studying avian and bat impact, will specifically address the eagle population in that study. EcoHarmony committed to discussing the completed study with both the DNR and the U.S. Fish and Wildlife Service. As to setbacks from eagle roosts, EcoHarmony indicated that its initial turbine siting resulted in setbacks of over one mile from known eagle roosts. (Exhibit 11, p. 15).

Vegetation

80. No public waters, wetlands or forested land are expected to be adversely affected by the project. No groves of trees or shelterbelts will need to be removed to construct and operate the system. Native prairie will also be avoided. If native prairie cannot be avoided, the site permit, at III. C.6., provides for preparation of a prairie protection and management plan.

Soils

81. Construction of the wind turbines and access roads in farmland increases the potential for erosion during construction. The site permit at III. B. 9. requires a soil erosion and sediment control plan. The project will also require a storm water run-off permit from the Minnesota Pollution Control Agency.

Geologic and Ground Water Resources

82. The geology of Fillmore County is defined as gently rolling or upland rolling plain. A significant feature of the regional geology is the existence of karstic limestone terrain. landscapes. Karst landscapes develop where mildly acidic groundwater contacts soluble limestone bedrock. Over long periods of time, this water to bedrock contact can slowly dissolve susceptible faces of carbonate bedrock and create cavities and voids in the bedrock. Such cavities and voids can potentially develop into sinkholes. Comments at the information meeting, written comments, testimony at the public hearing and written comments submitted into the hearing record expressed concerns about locating wind turbines in an area known for karst and the numerous sinkholes that exist or can occur in the project area.

83. To address this concern, Eco Energy Wind contracted with a geotechnical consulting firm, American Engineering Testing, to analyze, evaluate, and plan mitigation for potential issues with the karst topography. AET developed a *Work Plan for Geotechnical Investigation,* which includes but is not limited to the following:

> At each of the wind turbine sites, the geotechnical investigation will consist of three phases – (1) a geophysical investigation (electrical resistivity) to explore for voids in the bedrock; (2) followed by soil/bedrock borings to check the results of the electrical resistivity survey; (3) followed by a series of electric cone penetrometer (CPT) soundings if the potential for loose zones in the soil overburden are suspected.

84. AET also describes methods for ensuring that each wind turbine foundation is properly constructed depending on the soil conditions. As EcoHarmony stated in its application at page 45:

> The evaluation process will eliminate the selection of potential turbine sites that may be susceptible to sinkhole formation. In addition to the site evaluation, a system to monitor potential ground subsidence at turbine sites will be incorporated into project construction.

85. The proposed site permit incorporates requirements of the *Work Plan for Geotechnical Investigation* as a special condition under part III.M, to insure that turbine placement also considers karst features.

Surface Water and Wetlands

86. Access roads or utility lines will not be located in surface water or wetlands, unless authorized by the appropriate permitting agency. See site permit at III.C.5.

Future Development and Expansion

87. Current information suggests windy areas in this part of the state are large enough to accommodate more wind facilities. In the future, wind turbines used in Freeborn and surrounding counties will consist of several types and sizes supplied by different vendors and installed at different times.

88. While large-scale projects have occurred elsewhere (Texas, Iowa and California), little systematic study of the cumulative impact has occurred. Research on the total impact of many different projects in one area has not occurred. OES EFP staff will continue to monitor for impacts and issues related to wind energy development.

89. The Commission anticipates more site permit applications under Minnesota Statutes section 216F.04 (a). The Commission is responsible for siting of LWECS "in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources." Minnesota Statutes section 216F.03.

90. Minnesota Statutes section 216E.03, subd. 7 requires consideration of design options that might minimize adverse environmental impacts. By using larger turbines, fewer turbines are required, reducing siting needs for turbines and related facilities. Turbines must also be designed to minimize noise and aesthetic impacts. Buffers between strings of turbines are designed to protect the turbines' production potential. The site permit also provides for buffers between adjacent wind generation projects to protect production potential. See site permit at III.C.1.

91. The location and spacing of the turbines are critical to the issues of orderly development and the efficient use of wind resources. Turbines are likely to be located in the best winds, and the spacing dictates, among other factors, how much land area the project occupies. There is strong public support for orderly development.

92. One efficiency issue is the loss of wind in the wake of turbines. When wind is converted to rotational energy by the blades of a wind turbine, energy is extracted from the wind. Consequently, the wind flow behind the turbine is not as fast and is more turbulent than the free-flowing wind. This condition persists for some distance behind the turbine as normal wind flow is gradually restored. If a turbine is spaced too close downwind of another, it produces less energy and is less cost-effective. This is the wake loss effect. If the spacing is too far, wind resources are wasted and the projects' footprint on the land is unnecessarily large.

93. For this project, turbine spacing will try to maximize the use of the available wind resources and minimize wake and array losses within the topographical context of the site. Site topography, natural resource features, setback requirements and a host of other

factors are expected to result in a turbine design layout of turbines running parallel to each other and perpendicular to the prevailing wind. In some places, it is expected that the site will use shorter strings or clusters of and possibly isolated turbines locations within the site. The objective is to capture the most net energy possible from the best available wind resource. Allowing for setbacks from roads and residences and avoiding sensitive areas, EcoHarmony's nominal turbine spacing is expected to be 3 rotor diameters in the non-prevailing wind directions and five or more rotor diameters in the prevailing wind directions, northwest-southerly direction, with respect to the predominant energy production directions. Given the prevalence for southerly winds, the spacing between turbines will be greater in the prevailing winds in the northwest-southerly direction for the EcoHarmony West Wind Project Bent Tree Wind Project. EcoHarmony does not expect significant wake loss.

94. Other factors that lead to energy production discounts include turbine availability, blade soiling, icing, high wind hysteresis, cold weather shutdown, electrical efficiency and parasitic. Total losses typically range from 12 to 16 percent.

Maintenance

95. Maintenance of the turbines will be on a scheduled, rotating basis with one or more units normally off for maintenance each day, if necessary. Maintenance on the interconnection points will be scheduled for low wind periods. The EcoHarmony West Wind Project will be staffed with several wind technicians and a wind plant supervisor. An operations and maintenance facility will also be built near Harmony or in the project area. The operation and maintenance facility will be permitted by the local unit of government.

Decommissioning and Restoration

96. EcoHarmony expects that the life of the Project will be no less than 30 years. The land easement documents obtained provide for this 30-year life. Decommissioning and restoration are expected to be performed within 12 months of the end of the 30-year project life. EcoHarmony or the owner of the project may also re-apply for a LWECS site permit and continue operation of the Project. LWECS site permit renewal may be under a new long-term power purchase agreement (PPA), merchant operation of the Project, or replacement and re-powering of the Project.

97. Decommissioning activities will include (1) removal of all wind turbine components and towers; (2) removal of all pad mounted transformers; (3) removal of all above-ground distribution facilities; (4) removal of foundations; and (5) removal of surface road material and restoration of the roads and turbine sites to previous conditions to the extent feasible. The Permit (III.G.1.) requires the Permittee to submit a Decommissioning Plan to the PUC prior to commercial operation. The Permit (III.G.2.) addresses site restoration and paragraph (III.G.3.) addresses turbines abandoned prior to termination of operation of the LWECS.

98. The cost of decommissioning will be the responsibility of the project owner. A decommissioning fund will be put in place starting in year seven with $25,000 per turbine put aside, and every three years this amount will be adjusted for inflation. Decommissioning is required as part of the land easement agreements that will be recorded documents in Fillmore County. The owner of the project at the end of the 30 year life will have legal responsibility to decommission the project.

Site Permit Conditions

99. All of the above findings pertain to the Applicant's requested permit for a 280 megawatt wind project.

100. Most of the conditions contained in this site permit were established as part of the site permit proceedings of other wind turbine projects permitted by the Environmental Quality Board and the Public Utilities Commission. Comments received by the Commission have been considered in development of the site permit. Minor changes and special condition additions that provide for clarification or additional requirements have been made.

101. The site permit contains conditions that apply to site preparation, construction, cleanup, restoration, operation, maintenance, abandonment, decommissioning and all other aspects of the Project.

Based on the foregoing findings, the Minnesota Public Utilities Commission makes the following:

CONCLUSIONS OF LAW

1. Any of the foregoing findings which more properly should be designated as conclusions are hereby adopted as such.

2. The Minnesota Public Utilities Commission has jurisdiction under Minnesota Statute 216F.04 over the site permit applied for by EcoHarmony West Wind, LLC, for the 280 megawatt EcoHarmony West Wind Project.

3. The EcoHarmony West Wind, LLC, application for a site permit was properly filed and noticed as required by Minnesota Statutes 216F.04 and Minnesota Rules 7854.0600 subp 2 and 7854.0900 subp 2.

4. The Minnesota Public Utilities Commission has afforded all interested persons an opportunity to participate in the development of the site permit and has complied with all applicable procedural requirements of Minnesota Statutes Chapter 216F and Minnesota Rules Chapter 7854.

5. The Minnesota Public Utilities Commission is the agency directed to carry out the legislative mandate to site LWECS in an orderly manner compatible with environmental preservation, sustainable development and the efficient use of resources. The proposed 280 megawatt LWECS EcoHarmony West Wind Project will not create significant human or environmental impacts and is compatible with environmental preservation, sustainable development, and the efficient use of resources.

6. The Minnesota Public Utilities Commission has the authority under Minnesota Statutes section 216F.04 to establish conditions in site permits relating to site layout, construction and operation and maintenance of an LWECS. The conditions contained in the site permit issued to EcoHarmony West Wind, LLC, for the EcoHarmony West Wind Project are appropriate and necessary and within the Minnesota Public Utilities Commission's authority.

7. In accordance with Minnesota Rule 7854.0500 Subp.2., a site permit may not be issued until the certificate of need or other commitment requirement has been satisfied.

Based on the foregoing Findings of Fact and Conclusions of Law, the Minnesota Public Utilities Commission issues the following:

ORDER

A LWECS Site Permit is hereby issued to EcoHarmony West Wind, LLC, to construct and operate the 280 megawatt EcoHarmony West Wind Project in Fillmore County in accordance with the conditions contained in the site permit and in compliance with the requirements of Minnesota Statute 216F.04 and Minnesota Rules Chapter 7854 for PUC Docket No. IP-688/WS-08-973.

The site permit is attached hereto, with a map showing the approved site.

BY THR ORDER OF THE COMMISSION

_____

Burl W. Haar
Executive Secretary

(S E A L)

This document can be made available in alternative formats (i.e., large print or audio tape) by calling 651.297.4596 (Voice). Persons with hearing or speech disabilities may call us through Minnesota Relay at 1.800.627.3529 or by dialing 711.